BUCKLING ANALYSIS OF STIFFENED PANEL FOR AIRCRAFT FUSELAGE

UDAY DEEPIKA. A¹ & K. VEERANJANEYULU²

¹Assistant Professor, Department of Aeronautical Engineering, MLR Institute of Technology, Hyderabad, Telangana, India
²Associate Professor, Department of Aeronautical Engineering, MLR Institute of Technology, Hyderabad, Telangana, India

ABSTRACT

In the present work, structural analysis of stiffened panel for aircraft fuselage is performed for pure composites and composite plates with isogrid and orthogrid using FEM. In the bulking analysis of the panel, the static analysis is carried out under the specified loading and boundary conditions and results are extended to the buckling analysis. In the buckling analysis of stiffened panel, the mode shapes are extracted and frequencies are tabulated. The material selected for the analysis is carbon fiber, carbon fabric epoxy composite by precision contact lay-up. The fiber orientation for the isogrid structure is 60°/30° and for the orthogrid, the fiber orientation is 0°/90°. The analysis shows that the orthogrid structure is better than the other panels. The inplane load bearing capacity of the orthogrid structured panel is more than the isogrid panel structure. The weight of the orthogrid structured panel is less than the isogrid stiffened panel.

KEYWORDS: Structural Analysis, Epoxy Composite & Stiffened Panel

Received: Dec 02, 2017; Accepted: Dec 23, 2017; Published: Feb 15, 2017; Paper Id.: IJMPERDFEB2018150